

SciencEval Workshop

Michael Hill, Online, 11.12.2020



SWISS NATIONAL SCIENCE FOUNDATION



Historic Background

Henry Oldenburg



In 1665 Henry Oldenburg published the Philosophical Transactions of the Royal Society

In his wisdom he solicited expert opinions to ensure that he only publish the very best research in his journal

Ever since, expert refereeing has been a staple of scientific scrutiny and publishing

The END

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Early Forms of Peer Review



Ali Al Rahwi (AD 854-931, Syria)

The inquisition (published final verdicts, sentencing detail and the inquisitor's identity)

Royal Society of London's Royal Charter

Safeguard the reputation of the society

William Whewell



In 1831 William Whewell introduced a system by which two Royal Society fellows were to report on a paper

From its original open form it mutated into a closed review system

Refereeing was not related to rigour but to support the editor in their decision

Only by around 1900 were researchers expected to publish their findings in a reputable scientific journals

Alan T. Waterman



The Royal Society's Government Grant
(1849-1914)

War time contracts were transferred to the NIH
and mutated into “contract grants”

NSF used external panels and reviews to advise
staff on the quality of proposals but this was
optional throughout the first half of the 20th
century

During Waterman's tenure the NSF's budget rose
from \$3.5 M to over \$320 M

John Conlan



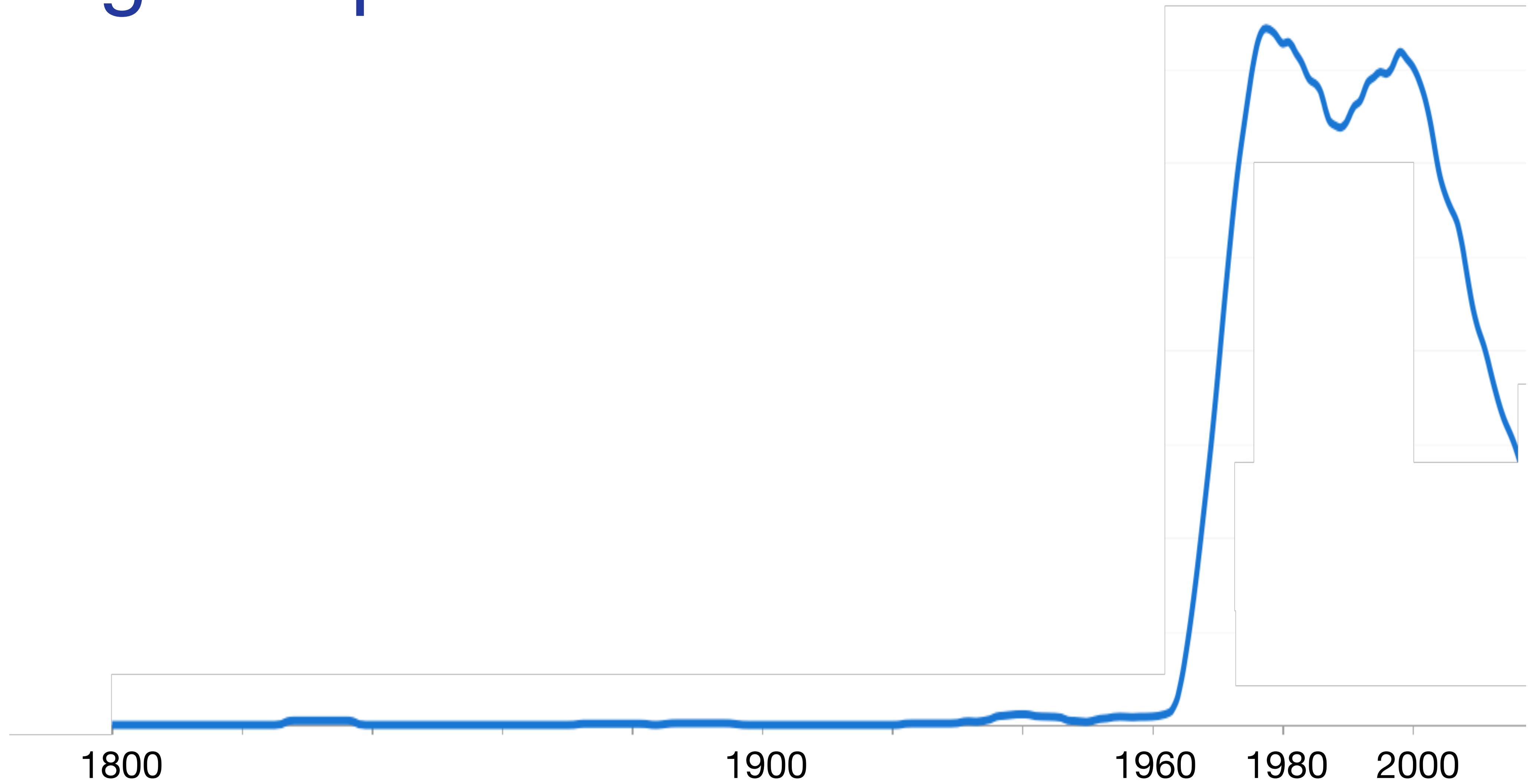
Because no one outside the NSF was allowed to see the reports neither scientists nor Congressmen could verify that NSF staff members were listening to the referees (which they sometimes weren't!)

Full text of referee reports and the names of the authors need to be available to grant applicants and the public

Scientists insisted in turn that anonymous refereeing was “indispensable” for science

“refereeing” —> “peer review” (i.e. only scientific experts)

Ngram “peer review”





Challenges

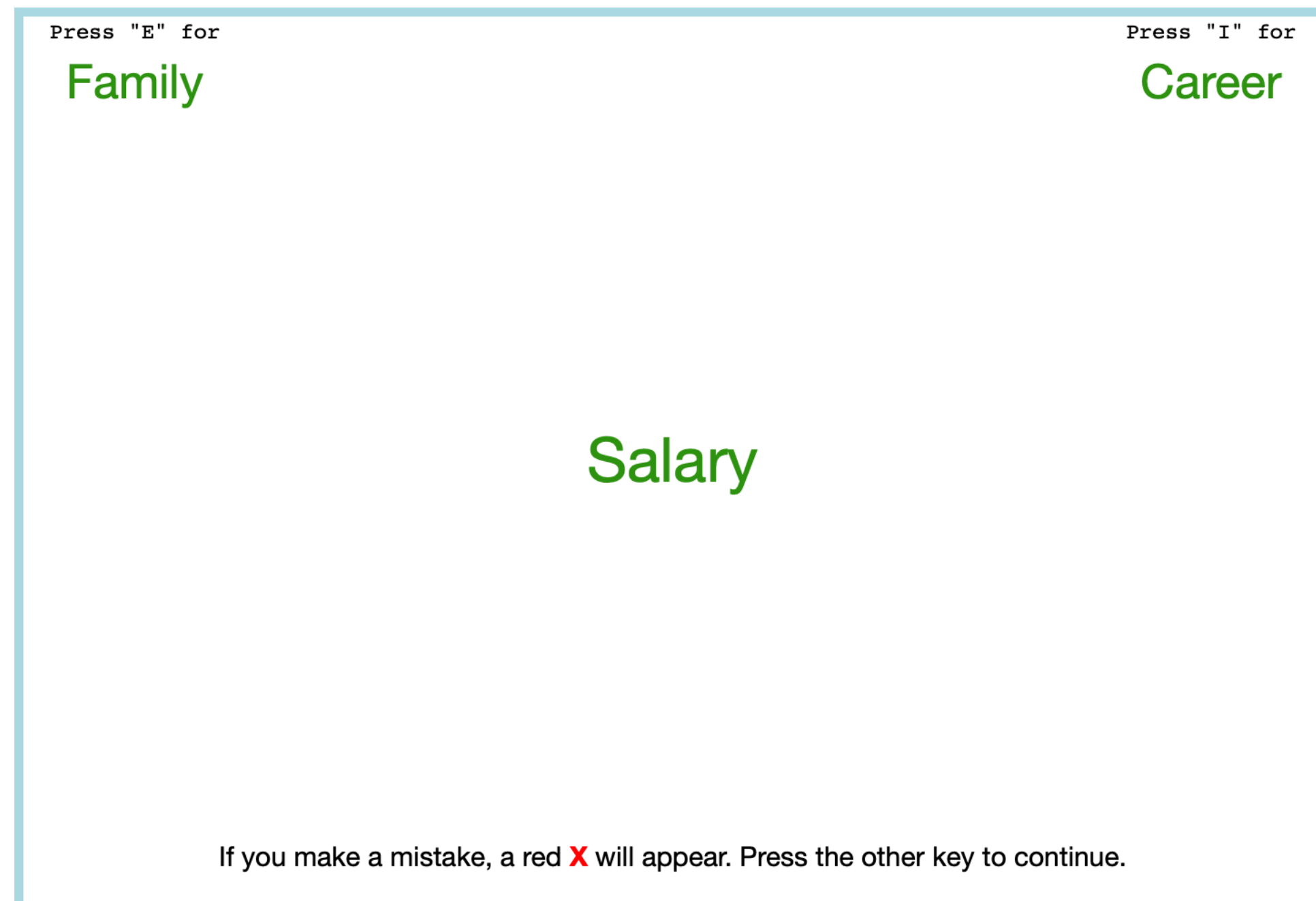


Implicit Bias

Prejudice — Stereotype — Implicit Bias — Discrimination

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Implicit Bias

Prejudice — Stereotype — Implicit Bias — Discrimination

Press "E" for
Family

Press "I" for
Career

Salary

If you make a mistake, a red **X** will appear. Press the other key to continue.

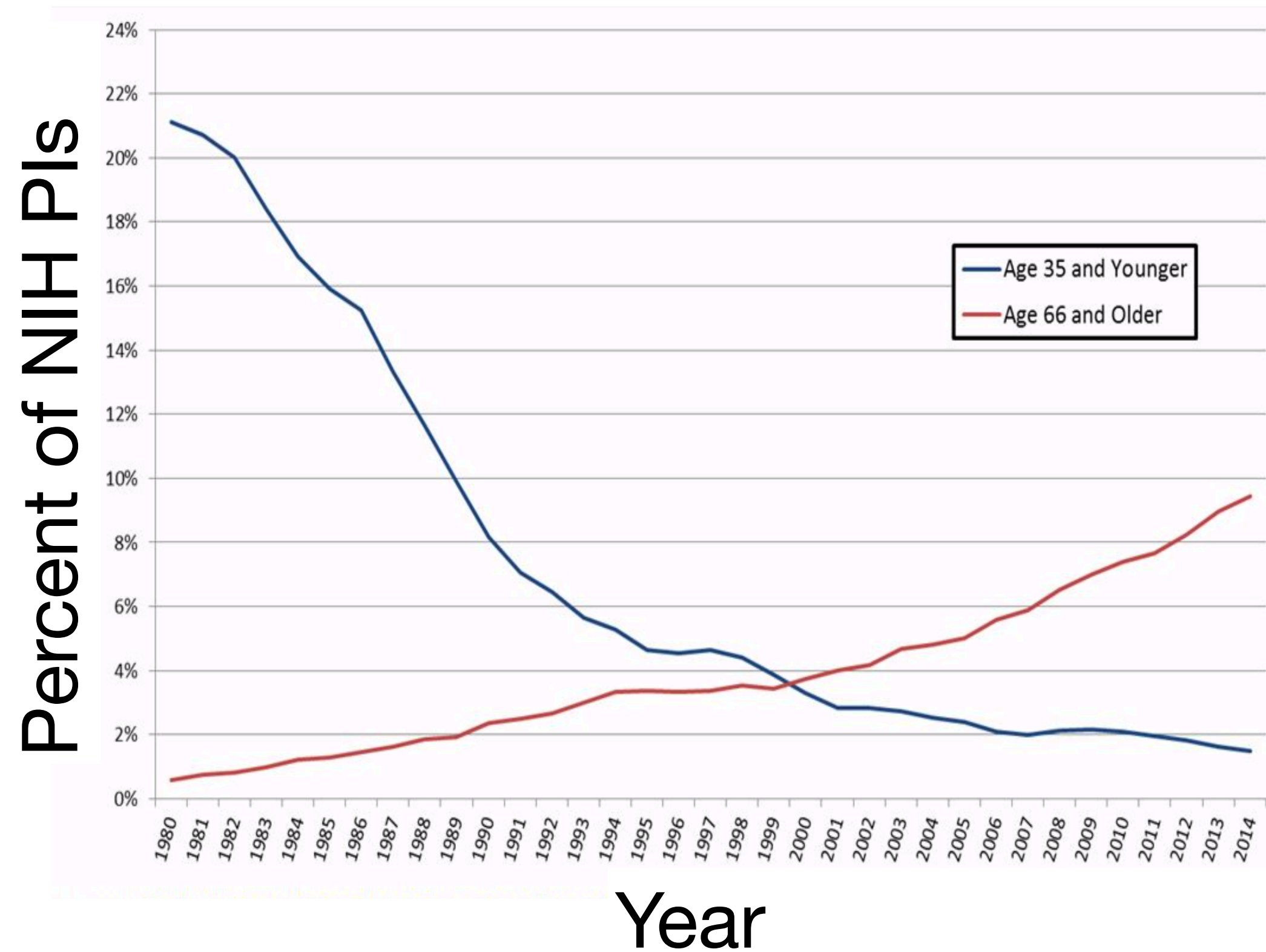
Press "E" for
Male

Press "I" for
Female

Anna

If you make a mistake, a red **X** will appear. Press the other key to continue.

Conservatism



Unorthodox treatment (homoeopathic sulphur) vs orthodox treatment (hydroxycitrate)

Excellence is often associated with rigour, which may contrast with novelty

“Referees frequently expect all potential problems to be identified and their solutions outlined. Unfortunately, it is not an exaggeration to say that the agencies expect a proposal to outline the anticipated discoveries.”

Resch, Ernst, & Garrow. J Royal Soc Med, 2000
Stanford. Synthese, 2015
Muller. Science, 1980
Hull. Science as a process, 1988
NIH, Report

The Matthew Effect

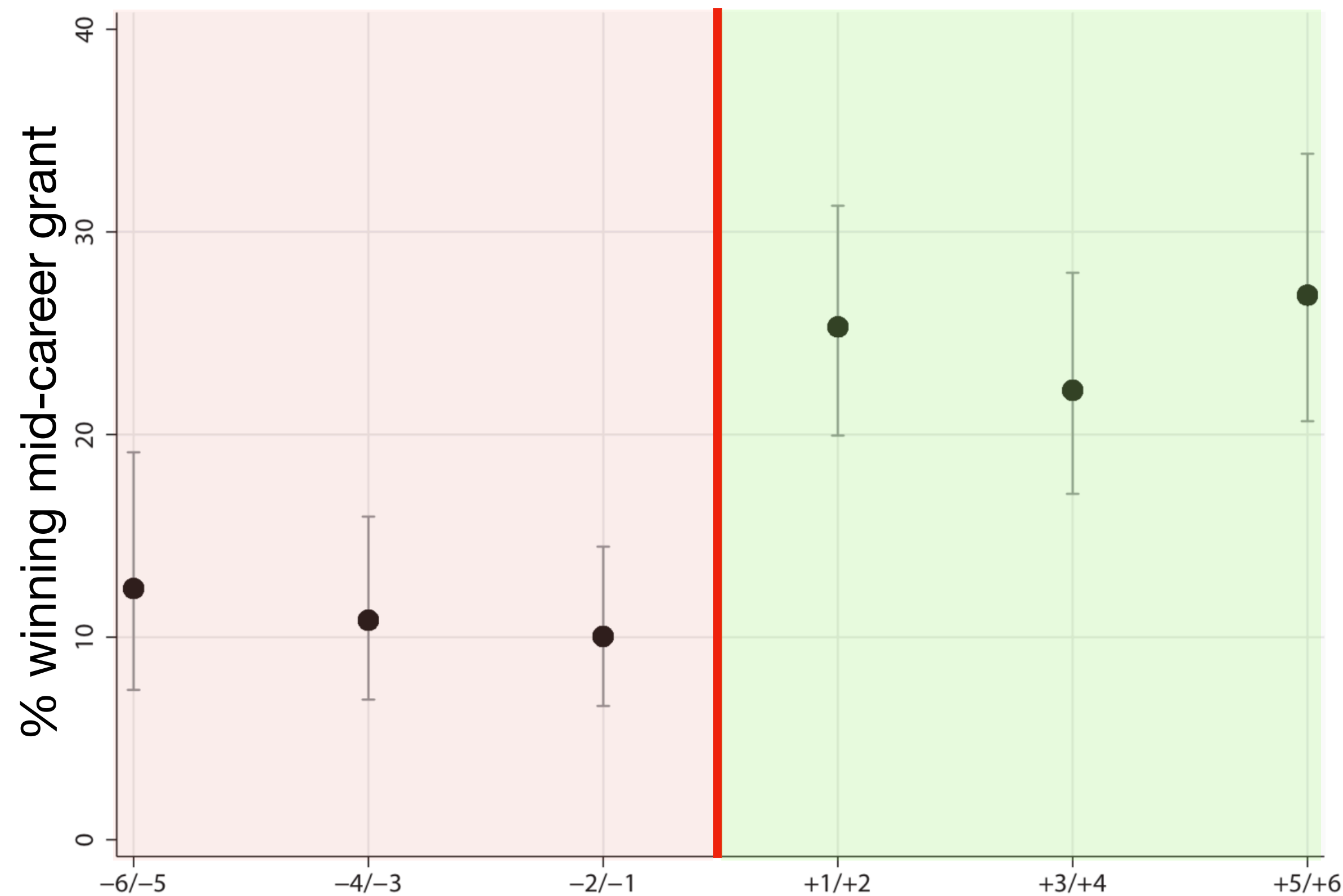


“For whosoever hath, to him shall be given, and he shall have more abundance: but whosoever hath not, from him shall be taken away even that he hath.”

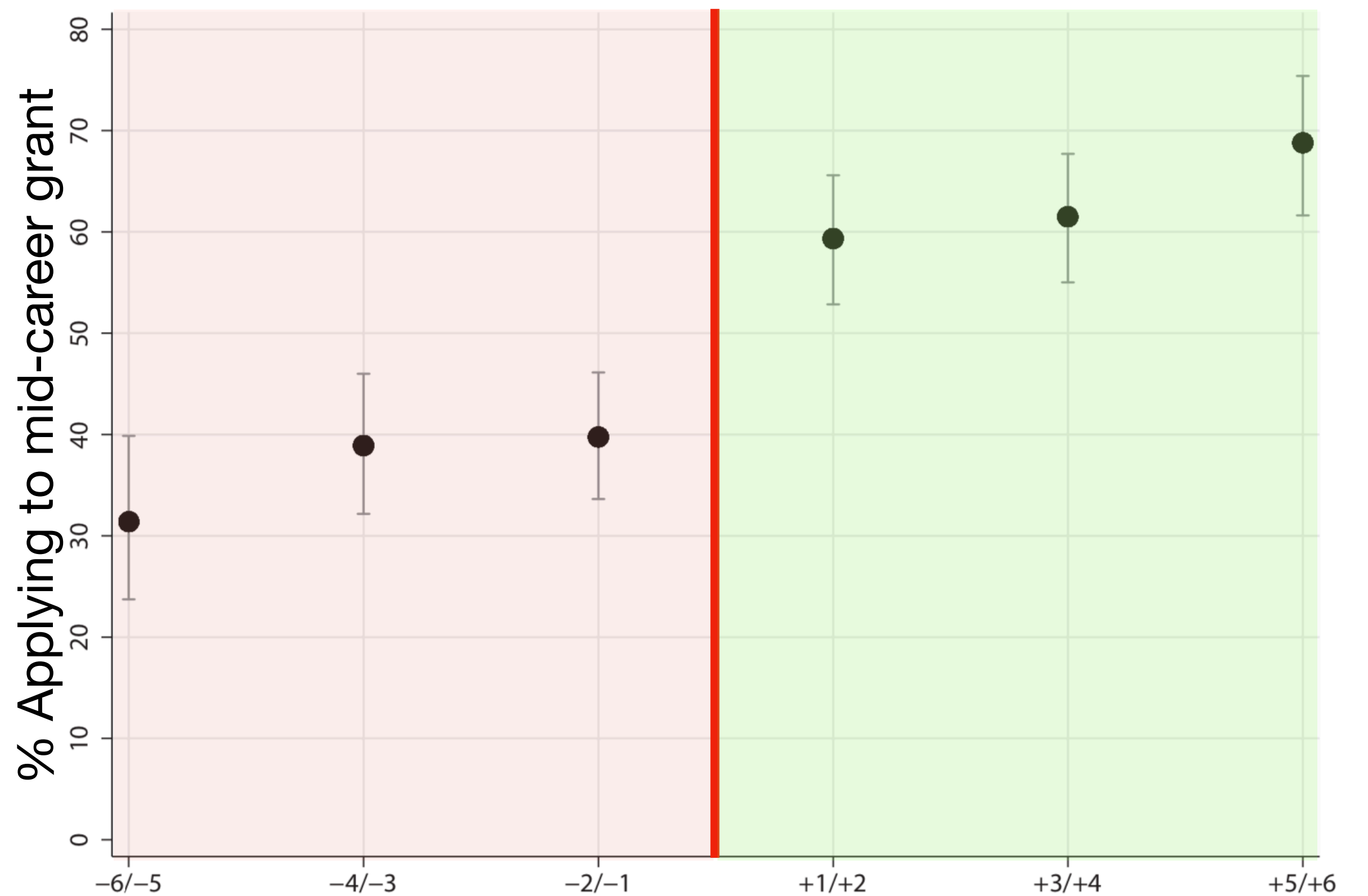
Matthew 13:12

Robert K. Merton in 1968

The Matthew Effect



Ranks away from early-career grant funding threshold

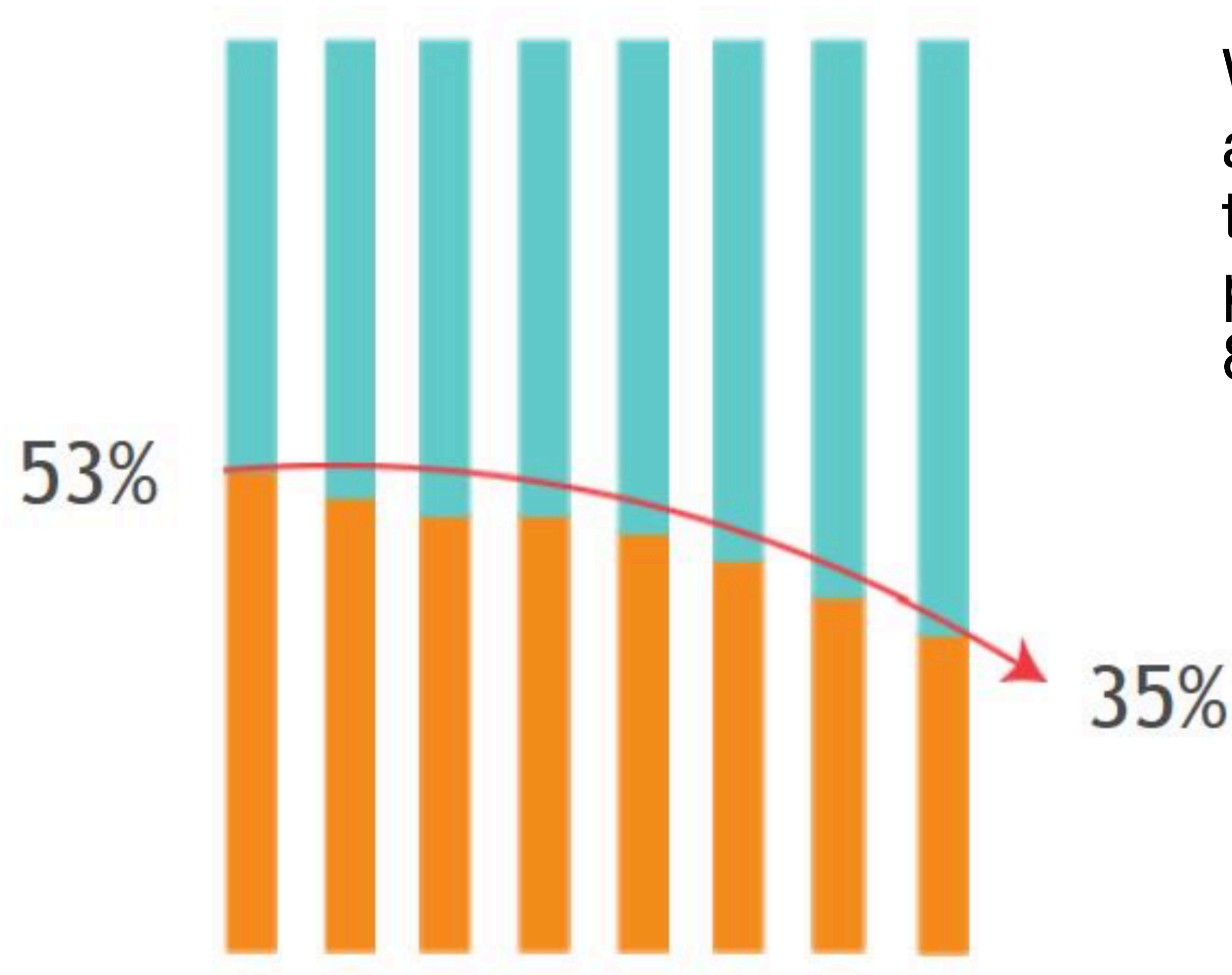


Ranks away from early-career grant funding threshold

Gender Bias

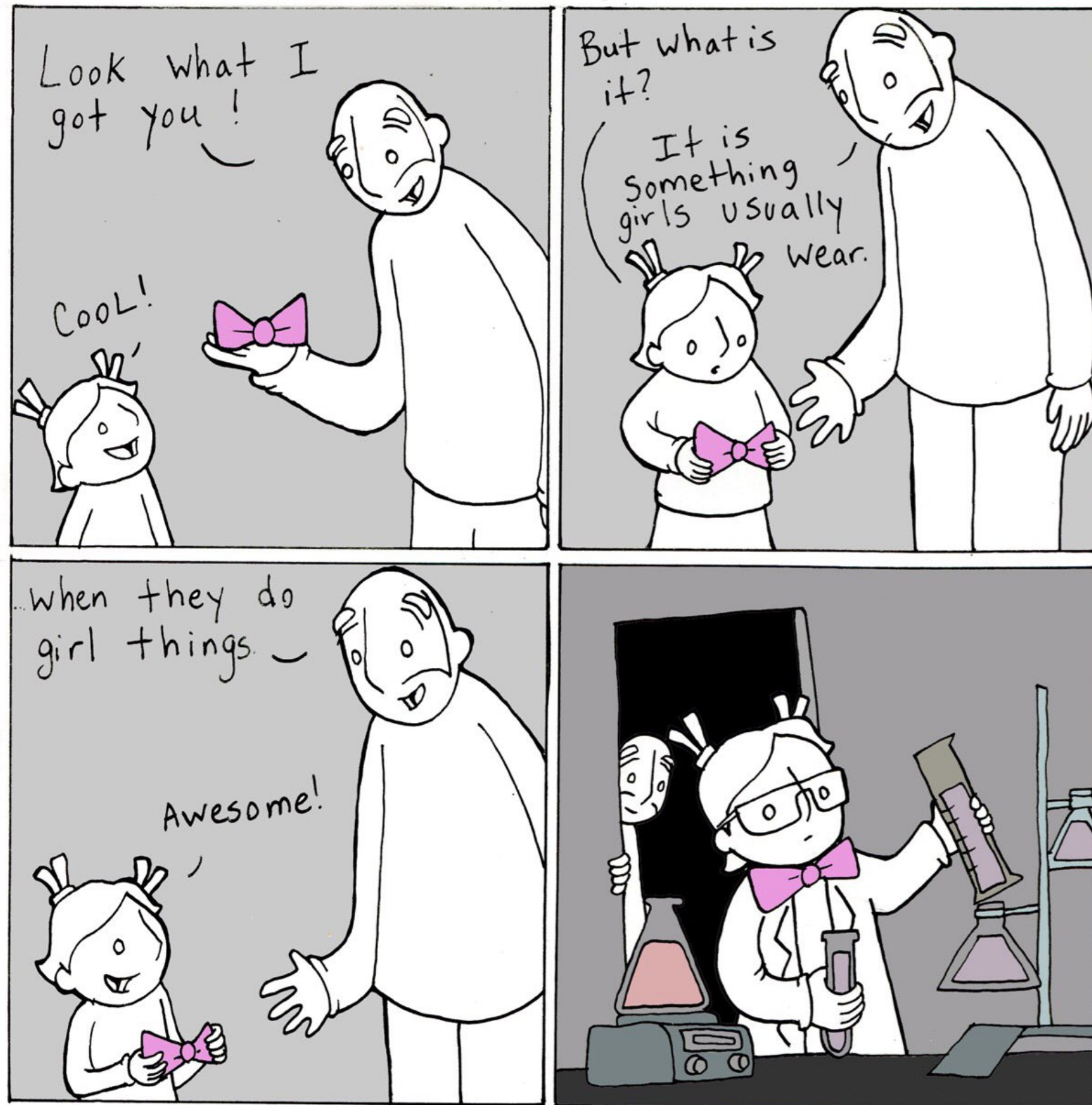


Gender Bias



When 1% of the variance in hiring is accounted for by gender differences, then only 35% of the highest level positions are filled by women at the 8th level

Gender Bias

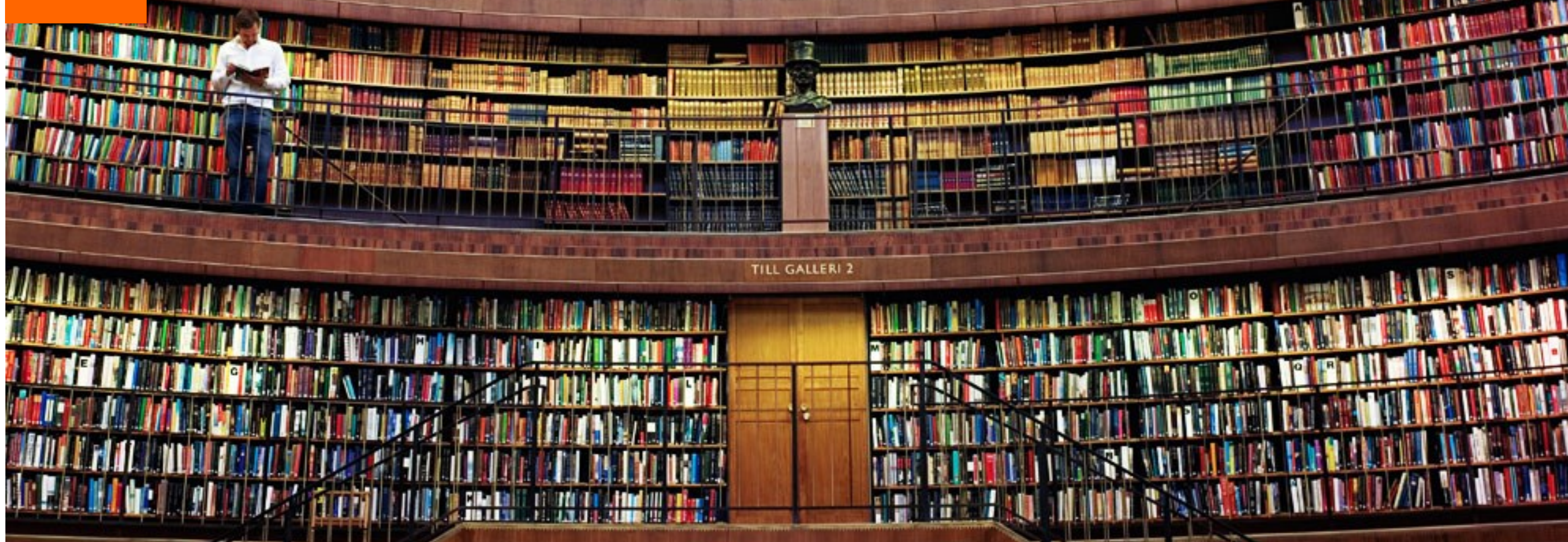


Double-blind review does not increase acceptance rates for female authors.

Manuscripts by female authors are not more often rejected at single-blind review journals

Meta- and large-scale studies of grant outcomes found no gender differences after adjusting for discipline, country, institution, experience, and past research output

Blank, R.M. American Economic Review, 1991
Marsh et al., 2009
Marsh, Jayasinghe, & Bond, 2011
RAND, 2005
loonarbaboon.com



Thank you

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